

Unit 11

Day 3

Equations of Lines

Section 3.4

Forms of a line:

STANDARD FORM

$ax + by = c$, a , b , and c must be integers, a must be +

SLOPE-INTERCEPT FORM $y = mx + b$ $m = \text{Slope}$
 $b = \text{y-intercept } (0, b)$

GENERAL FORM $ax + by + c = 0$ a , b , and c must be integers, a must be +

**** $f(x) = y$ function notation ****

A word about POINT-SLOPE FORM . . .

$$y - y_1 = m(x - x_1)$$

Note: Point-slope form is simply a manipulation of the slope formula. This is a useful form, but not necessary to know if you know the formula to slope. When m is an integer, this form is handy. But when m is a fraction, it gets a little messy to use. You'll see . . .

Find the equation of the line in standard form given the following information

1) $m=6$; $y_{\text{int}} (0,2)$

~~$y - y_1 = m(x - x_1)$
 $y - 2 = 6(x - 0)$~~

$$y = mx + b$$

$$y = 6x + 2$$

$$-6x + y = 2$$

$$\boxed{6x - y = -2}$$

Find the equation of the line in standard form given the following information

$$2) m = -\frac{1}{3}; \quad f(-3)=4$$

$(-3, 4)$

$$y - y_1 = m(x - x_1)$$

$$y - 4 = -\frac{1}{3}(x + 3)$$

$$-3y + 12 = x + 3$$

$$-x - 3y = -9$$

$$x + 3y = 9$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$-\frac{1}{3} = \frac{y - 4}{x + 3}$$

$$-x - 3 = 3y - 12$$

$$-x - 3y = -9$$

$$x + 3y = 9$$

3) $m=0$; $(2,5)$

horiz

$$y=5$$

4) $m = \text{undefined}$ (7, -3)

Vert

$$x = 7$$

$$5) (2, -1) (3, -2)$$

$$m = \frac{-1+2}{2-3} = \frac{1}{-1} = -1$$

$$-1 = \frac{y+1}{x-2}$$

$$-x+2 = y+1$$

$$-x-y = -1$$

$$x+y = 1$$

6) perpendicular to $-2x + y = 6$ $y = 2x + 6$
through pt $(-2, 6)$

$$\perp m = -\frac{1}{2}$$

$$-\frac{1}{2} = \frac{y - 6}{x + 2}$$

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